CLAIMS

1. A transducer for converting mechanical stress and vibrations into electric signals, said transducer comprising:

a transducer part and a connection part;

at least one transducer element with a first and a second side;

at least one dielectric layer at least on the first side of the transducer element;

at least one signal electrode in between the transducer element and the dielectric layer;

a ground electrode on second side of the transducer element;

wherein the transducer part has a unitary laminated structure; and

wherein the signal electrode is on the first side of the dielectric layer, between the dielectric layer and the transducer element, and second ground electrode is on the second side of the dielectric layer, and

wherein said electrodes continue from the transducer part as a connection part for connecting the transducer to a signal processing device; and

wherein the transducer element is a dielectric cellular electret film containing a permanent electric charge.

2. The transducer as defined in claim 1, wherein the dielectric cellular electret film is a biaxially oriented foamed film layer comprising essentially flat gas bubbles or voids or cells.

3. The transducer as defined in claim 2, wherein the dielectric cellular electret film is pressure inflated from prefoamed cellular film.

4. The transducer as defined in claim 1, wherein the electrodes at the connector end for connecting the transducer to a signal processing device are disposed side by side.

5. The transducer as defined in claim 1, wherein at least one signal electrode for connecting the transducer to a signal processing device is arranged at one end of the transducer.

6. The transducer as defined in claim 1, wherein at least two ground electrodes are electrically connected together at one end of said transducer.

7. The transducer as defined in claim 1, wherein several signal electrodes are arranged on the surface of one or more thin and flexible dielectric materials in such manner that in each one of the signal electrodes a separate charge signal can be generated.

8. The transducer as defined in claim 1, wherein signal and ground electrodes of the transducer are disposed side by side at the connector end to connect them to a signal processing device.

9. The transducer as defined in claim 1, wherein the transducer element is arranged between dielectric layers and the signal electrode is disposed on a dielectric layer facing the transducer element.

10. The transducer as defined in claim 1, wherein the signal electrode is essentially inside the transducer structure in order to reduce the electromagnetic interference.

11. The transducer as defined in claim 10, wherein a ground electrode is arranged on same face than said signal electrode to circulate the said signal electrode in order to reduce electromagnetic interference.

12. The transducer as defined in claim 1, said transducer constructed of a flexible layered sheet structure.

13. The transducer as defined in claim 1, wherein at least one weigh is attached on one side of the said transducer.

14. A transducer for converting mechanical stress or vibrations into electric signals, said transducer comprising:

at least one transducer element;

at least one dielectric film on at least one side of the transducer element;

at least one signal electrode;

at least one ground electrode;

a transducer part and a connection part;

wherein the signal electrode layer is arranged in between the dielectric film and transducer element, and

wherein the transducer element contains at least one permanently charged dielectric cellular electret film.

15. The transducer as defined in claim 14,
wherein the dielectric cellular electret film is a biaxially oriented foamed film layer comprising essentially flat gas bubbles or voids or cells.

16. The transducer as defined in claim 15,
wherein the dielectric cellular electret film is pressure inflated from prefoamed cellular electret film.

17. The transducer as defined in claim 14,
wherein a mass is attached on one side of the said transducer.

18. A transducer for converting mechanical stress and vibrations into electric signals, said transducer comprising:

at least one transducer element;

at least one dielectric layer on at least one side of the transducer element;

at least one signal electrode; and

at least one ground electrode, the transducer having a transducer part and a connection part;

wherein the transducer element is comprising at least one charged cellular electret film;

wherein at least the signal electrode is arranged between the dielectric layer and transducer element; and

wherein the signal electrode is essentially inside the transducer structure in order to reduce the electromagnetic interference.

19. The transducer as defined in claim 18, wherein a ground electrode is arranged on same face than said signal electrode to circulate the said signal electrode in order to reduce electromagnetic interference.

20. Method for forming a transducer for transforming mechanical stress and vibrations into electric signals, said transducer comprising:

at least one transducer element;

at least one dielectric film on at least one side of the transducer element;

at least one signal electrode, said signal electrode arranged in between the dielectric film and transducer element;

at least one ground electrode;

a transducer part;

a connection part;

wherein the transducer element is comprised of at least one cellular electret film containing a permanent electric charge;

forming signal electrodes of several transducers on one or more dielectric films or on cellular electret film material side by side;

gluing the dielectric films and the cellular electret film material against each other as a laminate so that the cellular electret film is placed in a desired area, said electrodes forming one or more electrically conductive surfaces required at each transducer and

cutting the laminate into several transducers

21. Method for forming a transducer according to claim 20, wherein the cellular electret film is permanently charged before or after cutting

22. Method for forming a transducer according to claim 20, wherein the electrically conductive surfaces formed by the electrodes are arranged side by side at one end of the transducer for connecting to a signal processing device.

23. Method for forming a transducer according to claim 21;

wherein a suitable fastening substance is applied in between the first dielectric film and the first side of the electromechanical transducer material, consisting at least one cellular electret film, fastening the first dielectric film and first side of the transducer material together so that the signal electrodes are arranged in between; and

fastening, with suitable substance, a second dielectric sheet and the laminate obtained above, the second side of the transducer element against the dielectric sheet, together, with ground electrodes arranged in between the transducer material and dielectric sheet.

24. Method for forming a transducer according to claim 23, wherein a laminate is obtained, from which the transducers are cut out.

25. Method for forming a transducer according to claim 20, wherein the cellular electret film is biaxially oriented foamed film layer comprising essentially flat gas bubbles or voids or cells.

25. Method for forming a transducer as defined in claim 24, wherein the cellular electret film is pressure inflated from prefoamed cellular film.

26. A transducer for converting mechanical stress into electric signals, said transducer comprising:

at least two transducer elements, said elements having first and second surfaces; at least one signal electrode layer arranged between two transducer elements, said signal electrode layer being a electrically conductive layer arranged in between the first surfaces of the two transducer film elements; and

at least two ground electrode layers, said ground electrode layers being electrically conductive layers arranged against the second sides of the transducer film elements;

and said electrodes extend from the transducer part as connection part for connecting the transducer to a signal processing device; and

wherein transducer elements are permanently charged cellular electret films.

27. The transducer according to claim 26, wherein cellular electret films are biaxially oriented foamed film layers.

28. The transducer as defined in claim 27, wherein the cellular electret film is pressure inflated from prefoamed cellular electret film.

29. Method for forming a transducer according to claim 28, wherein a mass is attached on the other side of the said transducer.

30. Method for forming a transducer comprising following steps:

arranging at least one signal electrode layer against first surface of a transducer film element;

arranging at least one signal electrode layer between first surfaces of two transducer elements, the signal electrode layer being a electrically conductive layer; and

arranging ground electrode layers against second surfaces of said transducer film elements;

wherein transducer part has a unitary laminated structure; and

wherein the transducer elements are permanently charged cellular electret films.

31. Method for forming a transducer according to claim 30, wherein cellular electret films are biaxially oriented foamed film layers comprising essentially flat gas bubbles or voids or cells.

32. Method for forming a transducer according to claim 31, wherein biaxially oriented foamed film layers, comprising essentially flat gas bubbles or voids or cells, are pressure inflated.

33. Method for forming a transducer according to claim 30, wherein one ground electrode has extension part overlapped over the connector part for forming a shield.

34. Method for forming a transducer according to claim 33, wherein the overlapped extension forms the shield for electronic preamplifier circuitry.

35. Method for forming a transducer according to claim 30, wherein a mass is attached on the other side of the said transducer.

36. A transducer for converting mechanical stress or vibrations into electric signals, said transducer comprising:

a transducer part and a connection part;

a transducer element with a first and a second side;

a dielectric layer on the first side of the transducer element;

a ground electrode in between the transducer element and the dielectric layer said ground electrode partially covering said transducer element;

at least one signal electrode on the second side of the dielectric layer;

wherein the transducer part has a unitary laminated structure; and

wherein said electrodes continue from the transducer part as a connection part for connecting the transducer to a signal processing device; and

wherein the transducer element is a dielectric cellular electret film containing a permanent electric charge.

37. Method for forming a transducer according to claim 36, wherein cellular electret films are biaxially oriented foamed film layers comprising essentially flat gas bubbles or voids or cells.

38. Method for forming a transducer according to claim 37, wherein biaxially oriented foamed film layers, comprising essentially flat gas bubbles or voids or cells, are pressure inflated.

39. The transducer as defined in claim 36, wherein several signal electrodes are arranged on the surface of one or more thin and flexible dielectric materials in such manner that in each one of the signal electrodes a separate charge signal can be generated.

40. Method for forming a transducer for transforming mechanical stress or vibrations into electric signals, said transducer comprising:

at least one transducer element;

at least one dielectric film on at least one side of the transducer element;

at least one ground electrode said ground electrode partially covering said transducer element; said ground electrode arranged in between the first side of said dielectric film and transducer element;

at least one signal electrode, said signal electrode arranged on second side of said dielectric film;

a transducer part;

a connection part;

wherein the transducer element is comprised of at least one cellular electret film containing a permanent electric charge;

forming said ground electrode of several transducers on one or more dielectric films or on cellular electret film material side by side;

arranging dielectric films and the cellular electret film material against each other as a laminate so that the cellular electret film is placed in a desired area, said electrodes forming one or more electrically conductive surfaces required at each transducer and

cutting the laminate into several transducers